

IN THE CLAIMS

Claim 1 (Currently Amended): ~~Aqueous~~ An aqueous suspension ~~of comprising~~ (1) one or more pigments, fillers or minerals, ~~which may contain and optionally~~ (2) a dispersant polymer to stabilise the rheology of the suspension, ~~the said pigments enabling the weight of the paper at constant surface area to be reduced, characterised by the fact that: wherein,~~

a) ~~it contains~~ said component (1) comprises a natural carbonate and the reaction product or products of the said carbonate with gaseous CO₂ and the reaction product or products of the said carbonate with one or more medium-strong to strong H₃O⁺ ion-providers, and

b) ~~it~~ wherein said suspension has a pH greater than 7.5 measured at 20° C.

Claim 2 (Currently Amended): ~~Aqueous~~ The aqueous suspension according to Claim 1 ~~characterised by the fact that wherein~~ the natural carbonate is a natural calcium carbonate ~~and preferably a marble, a calcite, a chalk or a carbonate containing dolomite.~~

Claim 3 (Currently Amended): ~~Aqueous~~ The aqueous suspension according to ~~any of~~ Claims 1 or 2 ~~characterised by the fact that Claim 1, wherein~~ the strong H₃O⁺ ion-provider ~~ion-providers are chosen from~~ is selected from the group consisting of hydrochloric acid, ~~or sulphuric acid or and mixtures thereof,~~ and the medium-strong H₃O⁺ ion-provider ~~ion-providers are chosen from among~~ is selected from the group consisting of H₂SO₃, HSO₄⁻, H₃PO₄, oxalic acid ~~or and mixtures thereof.~~

Claim 4 (Currently Amended): ~~Aqueous~~ The aqueous suspension according to ~~any of~~ Claims 1 to 3 ~~characterised by the fact that Claim 1, wherein~~ the quantity in moles of the

medium-strong to strong H_3O^+ ~~ion-providers~~ ion-provider relative to the number of moles of CaCO_3 is in total between 0.1 and 2, ~~and preferably between 0.25 and 1.~~

Claim 5 (Currently Amended): ~~Aqueous~~ The aqueous suspension according to ~~any of Claims 1 to 4 characterised by the fact that~~ Claim 1, wherein the pigment, filler or mineral has a BET specific surface area, measured in accordance with the ISO 9277 Standard, of between $5 \text{ m}^2/\text{g}$ and $200 \text{ m}^2/\text{g}$, ~~preferentially from $20 \text{ m}^2/\text{g}$ to $80 \text{ m}^2/\text{g}$ and very preferentially from $30 \text{ m}^2/\text{g}$ to $60 \text{ m}^2/\text{g}$.~~

Claim 6 (Currently Amended): ~~Aqueous~~ The aqueous suspension according to ~~any of Claims 1 to 5 characterised by the fact that~~ Claim 1, wherein the pigment, filler or mineral presents the following characteristics:

- a mean grain diameter, measured by the sedimentation method on a Sedigraph 5100™, between 50 and 0.1 micrometers, and
- ~~and~~ a BET specific surface area, measured in accordance with ISO 9277, ranging from $15 \text{ m}^2/\text{g}$ to $200 \text{ m}^2/\text{g}$,

~~and preferably characterised by the fact that the pigment, filler or mineral presents the following characteristics:~~

- ~~—— a mean grain diameter, measured by the sedimentation method on a Sedigraph 5100™, between 25 and 0.5 micrometers~~
- ~~—— and a BET specific surface area, measured in accordance with ISO 9277, ranging from $20 \text{ m}^2/\text{g}$ to $80 \text{ m}^2/\text{g}$.~~

Claim 7 (Currently Amended): ~~Aqueous~~ The aqueous suspension according to Claim 6 ~~characterised by the fact that~~ wherein the pigment, filler or mineral presents the following characteristics:

- a mean grain diameter, measured by the sedimentation method on a Sedigraph 5100™, between 7 and 0.7 micrometers, and
- ~~and~~ a BET specific surface area, measured in accordance with ISO 9277, ranging from 30 m²/g to 60 m²/g.

Claim 8 (Currently Amended): ~~Pigment~~ A pigment, filler or mineral in the dry state ~~characterised by the fact that it is obtained by drying the an~~ aqueous suspension according to ~~any of Claims 1 to 7~~ Claim 1.

Claim 9 (Currently Amended): ~~Process~~ A process for treating pigments, fillers or minerals in aqueous suspension, containing a natural ~~calcium~~ carbonate ~~allowing a reduction in the weight of the paper for a constant surface area, characterised by the fact that the said pigment is treated~~ comprising treating said pigments, fillers or minerals with a combination of one or more medium-strong to strong H₃O⁺ ion-providers and gaseous CO₂.

Claim 10 (Currently Amended): ~~Process~~ The process ~~for treating pigments, fillers or minerals in aqueous suspension, containing a natural calcium carbonate allowing a reduction in the weight of the paper for a constant surface area according to Claim 9, characterised by the fact that~~ wherein the gaseous CO₂ comes from an external CO₂ supply or from the recirculation of CO₂ or from the continuous addition of the same or not medium-strong to strong provider of H₃O⁺ ions as used in the treatment of from an excess pressure of CO₂ ~~preferably in the range from 0.05 to 5 bars.~~

Claim 11 (Currently Amended): ~~Process~~ The process ~~for treating pigments, fillers or minerals in aqueous suspension, containing a natural calcium carbonate allowing a reduction in the weight of the paper for a constant surface area according to Claim 9 or 10,~~
~~characterised by the fact that it comprises~~ further comprising the following three stages:

- a) Treatment with one or more medium-strong to strong providers of H_3O^+ ions
- b) Treatment with gaseous CO_2 , whether this treatment be an integral part of stage a), be carried out in parallel with stage a) or be carried out after stage a)
- c) The raising of the pH beyond 7.5, measured at 20°C , in a time interval after the end of stages a) and b) of between 1 hour and 10 hours ~~and preferably between 1 hour and 5 hours~~ without addition of a base, or immediately after the end of stages a) and b) with the addition of a base, stage c) being the final stage in the process.

Claim 12 (Currently Amended): ~~Process~~ The process ~~for treating pigments, fillers or minerals in aqueous suspension containing a natural calcium carbonate allowing a reduction in the weight of the paper for a constant surface area according to Claim 11, characterised by the fact that~~ wherein stages a) and b) may be repeated several times.

Claim 13 (Currently Amended): ~~Process~~ The process ~~for treating pigments, fillers or minerals in aqueous suspension containing a natural calcium carbonate allowing a reduction in the weight of the paper for a constant surface area according to any of Claims 9 to 12,~~
~~characterised by the fact that~~ Claim 11, wherein the pH measured at 20°C is between 3 and 7.5 during stages a) and b) of the treatment and by the fact that the treatment temperature is between 5°C and 90°C ~~, and preferably between 45°C and 60°C .~~

Claim 14 (Currently Amended): ~~Process~~ The process ~~for treating pigments, fillers or minerals in aqueous suspension containing a natural calcium carbonate allowing a reduction in the weight of the paper for a constant surface area according to any of Claims 9 to 13, characterised by the fact that~~ Claim 11, wherein the concentration of gaseous CO₂ in the suspension is, in terms of the volume, ~~such that the~~ ratio (volume of suspension : volume of gaseous CO₂) is between 1:0.05 and 1:20 with the said ratio being between 1:1 and 1:20 in stage a) and between 1:0.05 and 1:1 in stage b).

Claim 15 (Currently Amended): ~~Process~~ The process ~~for treating pigments, fillers or minerals in aqueous suspension containing a natural calcium carbonate allowing a reduction in the weight of the paper for a constant surface area according to Claim 14, characterised by the fact that~~ wherein the concentration of gaseous CO₂ in the suspension is, in terms of the volume, ~~such that the~~ ratio which is the (volume of suspension : volume of gaseous CO₂) is between 1:0.05 and 1:10 with the said ratio being between 1:0.5 and 1:10 in stage a) and between 1:0.05 and 1:1 in stage b).

Claim 16 (Currently Amended): ~~Process~~ The process ~~for treating pigments, fillers or minerals in aqueous suspension containing a natural calcium carbonate allowing a reduction in the weight of the paper for a constant surface area according to any of Claims 9 to 15, characterised by the fact that~~ Claim 11, wherein the duration of stage b) of the treatment is between 0 hours and 10 hours and ~~preferably between 2 hours and 6 hours.~~

Claim 17 (Currently Amended): ~~Process~~ The process ~~for treating pigments, fillers or minerals in aqueous suspension containing a natural calcium carbonate allowing a reduction~~

~~in the weight of the paper for a constant surface area according to any of Claims 9 to 16,~~
~~characterised by the fact that Claim 9, wherein the pigment, filler or mineral containing~~
~~natural calcium carbonate is chosen from among the group consisting of natural calcium~~
~~carbonate, or a carbonate containing a dolomite, and mixtures thereof with talc, and/or~~
~~mixtures thereof with kaolin, mixtures thereof with and or titanium oxide TiO_2 , magnesium~~
~~oxide MgO and other minerals which are inert towards the medium-strong to strong H_3O^+~~
~~ion-providers known in the paper field.~~

Claim 18 (Currently Amended): ~~Process~~ The process ~~for treating pigments, fillers or~~
~~minerals in aqueous suspension containing a natural calcium carbonate allowing a reduction~~
~~in the weight of the paper for a constant surface area according to Claim 17, characterised by~~
~~the fact that wherein the natural calcium carbonate is a marble, a calcite or a chalk.~~

Claim 19 (Currently Amended): ~~Process~~ The process ~~for treating pigments, fillers or~~
~~minerals in aqueous suspension containing a natural calcium carbonate allowing a reduction~~
~~in the weight of the paper for a constant surface area according to any of Claims 9 to 18,~~
~~characterised by the fact that Claim 9, wherein the strong provider or providers of H_3O^+ ions~~
~~are chosen from among is hydrochloric acid or sulphuric acid and that the medium-strong~~
~~provider or providers of H_3O^+ ions are chosen from among is selected from the group~~
~~consisting of H_2SO_3 , HSO_4^- , H_3PO_4 and oxalic acid.~~

Claim 20 (Currently Amended): ~~Process~~ The process ~~for manufacturing the aqueous~~
~~suspension characterised by the fact that after the three stages of the treatment process~~
~~according to the invention, a dispersing agent and if appropriate a reconcentration stage may~~

~~be used~~ according to Claim 11, further comprising the addition of a dispersing agent and optionally a reconcentration stage, after the third stage of treatment.

Claim 21 (Currently Amended): ~~New~~ An aqueous ~~suspensions~~ suspension of a ~~plurality of several pigments~~, fillers or minerals containing a natural ~~calcium~~ carbonate, ~~allowing a reduction in the weight of the paper for a constant surface area characterised by the fact that they consist of the~~ wherein said suspensions are suspension is obtained by the process according to ~~any of Claims 9 to 20~~ Claim 9.

Claim 22 (Currently Amended): ~~New~~ An aqueous ~~suspensions of a plurality of several pigments~~, fillers or minerals containing a natural calcium carbonate ~~allowing a reduction in the weight of the paper for a constant surface area according to Claim 21, characterised by the fact that~~ wherein the pigment, filler or mineral containing a natural carbonate is chosen from ~~among the group consisting of~~ natural ~~calcium~~ carbonate, ~~or a carbonate containing a dolomite, and mixtures thereof with talc, and/or mixtures thereof with kaolin, mixtures thereof with~~ and/or mixtures thereof with ~~and/or~~ titanium oxide TiO₂, magnesium oxide MgO and other minerals which are inert towards the medium-strong to strong H₃O⁺ ion-providers ~~known in the paper field.~~

Claim 23 (Currently Amended): ~~Pigment~~ A pigment, filler or mineral in the dry state, ~~characterised by the fact that it is obtained by drying an aqueous suspension according to any of Claims 21 to 22~~ Claim 21.

Claim 24 (Currently Amended): ~~Preparations~~ A preparation for use in paper-making, characterised by the fact that they contain comprising at least one aqueous suspension according to ~~any of Claims 1 to 7 or 21 to 22~~ Claim 1.

Claim 25 (Currently Amended): A process for ~~Utilisation of the aqueous suspensions~~ according to ~~any of Claims 1 to 7 or 21 to 22~~ for coating paper comprising applying the aqueous suspensions as claimed in Claim 1 onto a sheet of paper.

Claim 26 (Currently Amended): A process for making a paper sheet with ~~Utilisation of the aqueous suspensions according to any of Claims 1 to 7 or 21 to 22 as~~ a paper filler comprising manufacturing a sheet of paper with the aqueous solution claimed in Claim 1.

Claim 27 (Currently Amended): A process for coating and manufacturing a sheet of paper comprising coating and impregnating, in any order, a sheet of paper with the ~~Simultaneous utilisation of the aqueous suspensions according to any of Claims 1 to 7 or 21 to 22~~ aqueous solution claimed in Claim 1 wherein said aqueous solution acts as a paper filler and as a preparation for coating and pigmentation of the surface of the paper.

Claim 28 (Currently Amended): The process as claimed in Claim 26 wherein, ~~Utilisation of the aqueous suspensions according to Claim 26 characterised by the fact that~~ the weight of the paper produced, at constant surface area, is reduced by 3% to 15%.

Claim 29 (Currently Amended): A paint or coating comprising the aqueous solution as claimed in Claim 1. ~~Utilisation of the aqueous suspensions according to any of Claims 1 to 7 or 21 to 22 in the field of paint.~~

Claim 30 (Currently Amended): ~~Process~~ A process for manufacturing a sheet of paper; ~~or board or similar, characterised by the fact that it includes the incorporation of~~ comprising incorporating a suspension or preparation according to ~~any of Claims 1 to 7 or 21 to 22~~ Claim 1 in the ~~a~~ process of manufacture of the sheet in terms of the preparation of the ~~a~~ thick stock or the ~~a~~ thin stock or both ~~of these depending on the papermaking process, one or more times.~~

Claim 31 (Currently Amended): ~~Process for manufacturing a sheet of paper, board or similar according to Claim 30, characterised by the fact that it includes the incorporation of a suspension or preparation according to any of Claims 1 to 7 or 21, 22 or 24 in the recycled white liquor or in the "coating broke", also recycled.~~ A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation according to Claim 1 in the process of manufacture of said sheet wherein said suspension or preparation is added to a recycled white liquor or to a recycled coating broke.

Claim 32 (Currently Amended): ~~Process for manufacturing a sheet of paper, board or similar according to Claims 30 or 31, characterised by the fact that the process is applied according to any of Claims 9 to 20 to the recycled white liquor or to the "coating broke".~~ A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation according to Claim 9 in said process of manufacture of said sheet wherein said suspension or preparation is added to a recycled white liquor or to a recycled coating broke.

Claim 33 (Currently Amended): ~~Process for manufacturing a sheet of paper, board or similar according to any of Claims 30 to 32, characterised by the fact that it is applied to the~~

~~manufacture of paper obtained from cellulose fibres made from wood such as deciduous or resinous woods.~~ A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation according to Claim 1 in the process of manufacture of said sheet wherein said sheet is obtained from cellulose fibres made from wood.

Claim 34 (Currently Amended): ~~Process for manufacturing a sheet of paper, board or similar according to any of Claims 30 to 32, characterised by the fact that it is applied to the manufacture of paper obtained from fibres not originating from wood but on the contrary synthetic fibres.~~ A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation according to Claim 1 in the process of manufacture of said sheet wherein said sheet is obtained from fibres not originating from wood.

Claim 35 (Currently Amended): ~~Paper, board or similar characterised by the fact that it is obtained according to any of Claims 30 to 34.~~ A paper or board obtained by the process as claimed in Claim 30.

Claim 36 (Currently Amended): ~~Paper according to Claim 35, for digital printing applications and preferably for ink jet printing.~~ A method of printing comprising digitally applying ink onto the paper or board claimed in Claim 35.

Claim 37 (New): The aqueous suspension claimed in Claim 1 wherein the natural carbonate is selected from the group consisting of marble, calcite, chalk and carbonate containing dolomite.

Claim 38 (New): The aqueous suspension according to Claim 4, wherein the quantity in moles of the medium-strong to strong H_3O^+ ion-providers relative to the number of moles of CaCO_3 is in total between 0.25 and 1.

Claim 39 (New): The aqueous suspension according to Claim 1, wherein the pigment, filler or mineral has a BET specific surface area, measured in accordance with the ISO 9277 Standard, of from $20 \text{ m}^2/\text{g}$ to $80 \text{ m}^2/\text{g}$.

Claim 40 (New): The aqueous suspension according to Claim 1, wherein the pigment, filler or mineral has a BET specific surface area, measured in accordance with the ISO 9277 Standard, of from $30 \text{ m}^2/\text{g}$ to $60 \text{ m}^2/\text{g}$.

Claim 41 (New): The aqueous suspension according to Claim 6, wherein the pigment, filler or mineral presents the following characteristics:

- a mean grain diameter, measured by the sedimentation method on a Sedigraph 5100™, between 25 and 0.5 micrometers, and
- a BET specific surface area, measured in accordance with ISO 9277, ranging from $20 \text{ m}^2/\text{g}$ to $80 \text{ m}^2/\text{g}$.

Claim 42 (New): The process as claimed in Claim 10, wherein the CO_2 pressure is from 0.05 to 5 bars.

Claim 43 (New): The process as claimed in Claim 11, wherein the raising of the pH beyond 7.5, measured at 20°C , in a time interval after the end of stages a) and b) of between

1 hour and 5 hours without addition of a base, or immediately after the end of stages a) and b) with the addition of a base, stage c) being the final stage in the process.

Claim 44 (New): The process as claimed in Claim 13 wherein the treatment temperature is between 45 and 60°C.

Claim 45 (New): The process as claimed in Claim 16 wherein the duration of stage b) of the treatment is between 2 hours and 6 hours.

Claim 46 (New): A preparation for use in paper-making, comprising at least one aqueous suspension according to Claim 21.

Claim 47 (New): A process for coating paper comprising applying the aqueous suspension as claimed in Claim 21 onto a sheet of paper.

Claim 48 (New): A process for making a paper sheet with a paper filler comprising manufacturing a sheet of paper with the aqueous suspension claimed in Claim 21.

Claim 49 (New): A process for coating and manufacturing a sheet of paper comprising coating and impregnating, in any order, a sheet of paper with the aqueous solution claimed in Claim 21 wherein said aqueous solution acts as a paper filler and as a preparation for coating and pigmentation of the surface of the paper.

Claim 50 (New): A paint or coating comprising the aqueous suspension as claimed in Claim 21.

Claim 51 (New): A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation according to Claim 21 in the process of manufacture of the sheet in terms of a preparation of a thick stock or a thin stock or both, one or more times.

Claim 52 (New): A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation according to Claim 21 in the process of manufacture of said sheet wherein said suspension or preparation is added to a recycled white liquor or to a recycled coating broke.

Claim 53 (New): The process claimed in claim 33 wherein said cellulose fibers are from a deciduous or resinous wood.

Claim 54 (New): A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation according to Claim 51 in the process of manufacture of said sheet wherein said suspension or preparation is added to a recycled white liquor or to a recycled coating broke.

Claim 55 (New): A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation according to Claim 51 in the process of manufacture of said sheet wherein said suspension or preparation is added to a recycled white liquor or to a recycled coating broke.

Claim 56 (New): A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation according to Claim 51 in the process of manufacture of said sheet wherein said sheet is obtained from cellulose fibers made from wood.

Claim 57 (New): A process for manufacturing a sheet of paper or board comprising incorporating a suspension or preparation according to Claim 51 in the process of manufacture of said sheet wherein said sheet is obtained from fibers not originating from wood.

Claim 58 (New): A paper or board obtained by the process as claimed in Claim 51.

Claim 59 (New): A method of printing comprising digitally applying ink onto the paper or board claimed in Claim 58.

Claim 60 (New): A preparation for use in paper-making, comprising at least one aqueous suspension according to Claim 21.

DISCUSSION OF THE AMENDMENT

The claims are now in the same condition as they were as of the amendment filed April 4, 2003 in the parent application, **except** Claims 1 and 9 do not include the subject matter of Claim 5, and Claim 5 has not been cancelled.

No new matter has been added by the above amendment. Claims 1-60 are now pending in the application.